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SOME ECONOMIC ASPECTS OF SURPLUS CONTROL WITH PARTICULAR REFERENCE TO THE SUMMER ORANGE INDUSTRY OF CALIFORNIA

(A preliminary report)

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Conclusions

In preparing a plan for the stabilization of the summer orange industry the following considerations should receive careful attention.

1. Regulation of shipments as to quantity, quality, time and place affords a means of immediately alleviating the difficulties of surplus production of California summer oranges while the more slowly operating factors of an increase in demand, a reduction in marginal acreage, a decrease in the cost of marketing, and a decrease in the cost of production are correcting the situation.

2. Growers controlling at least 90 per cent of the summer oranges produced in California should participate.

3. In years of surpluses adequate regulation of shipments as to quantity necessitates limitations of the volume of packed fruit marketed in the United States. In 1932 a reduction of 20 per cent in the packed-fruit shipments to domestic markets would have resulted in an increase of about 35 per cent in the returns per acre.

4. Limitation of shipments should apply first to the sizes and grades selling at the lowest prices. If in 1932 all lower grade fruit smaller than 216s and all first grade fruit smaller than 288s had been withheld from the market, the returns per acre would have been about 5 per cent higher than if the same quantity reduction had been applied proportionately to all grades and sizes.

5. In a year when the surplus is large and the crop is of average or better than average quality, a portion of the fruit ordinarily shipped as first grade will have to be withheld from the market if returns per acre are to be substantially increased. In 1932, a season of poorer than average quality, lower grade fruit which sold at prices below the least desirable sizes of first grade fruit constituted less than 12 per cent of the total shipments of all sizes and grades.

6. Careful regulation of shipments from week to week and between markets to insure the maintenance of trade confidence and the avoidance of temporary gluts is even more advantageous in years of surplus production than in normal years.

7. If shipments are limited in only those years in which surpluses are actually present and a quantity no larger than the surplus is withheld from the market, it is not likely to cause a decrease in consumer demand or an increase in the acreage planted.

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Scope of this Report

This report is confined to an analysis of the results that would be obtained from the regulation of packed-fruit shipments of California summer oranges (those shipped during the six months May to October inclusive) in the domestic markets of the United States upon the average f.o.b. prices and average returns per acre for the season. In addition to the information contained herein, a complete analysis of the regulation of packed-fruit shipments in domestic markets would include the following:

1. The effects of limitation of shipments during the first and latter parts of the season when supplies from other states are on the markets.

2. The effect of limitation of shipments of certain sizes and grades upon prices of those sizes and grades and other sizes and grades.

3. Further analysis regarding the effects of limitation of shipments upon consumer demand and upon plantings.

A complete picture of the summer orange situation would include an analysis of the sale of loose fruit and export shipments as well as the sale of packed-fruit in domestic markets. Similar analyses of the winter orange situation should be made. Data relating to these phases are now being collected and analyzed.

Ways of Reducing or Eliminating Surpluses

The sharp decline in the general price level of all commodities and the pronounced decrease in the buying power of consumers resulted in a surplus of California summer oranges in 1932. This surplus condition is likely to continue, and may become worse, whenever yields per acre are average or above as long as the buying power of consumers remains at the present low level.

In this report a surplus of oranges is understood to exist when the quantity produced is larger than the quantity that can be sold at a price which covers the normal costs of the representative grower. If all of the crop can be sold at a price which will result in a net increase in acreage, there is no surplus. But if the price at which all of the crop can be sold will, if continued for a period of years, cause a net decrease in acreage, or cause an increase in neglect or abandonment of orchards, there is a surplus. A surplus may exist even though the entire crop is sold if the price at which it is sold is so low that the returns to the efficient growers who own good orchards are less than those required to maintain them in the business.

According to the definition given above there was a surplus of summer oranges in 1932; and if the crop is again large, there is likely to be a surplus in 1933.

The fundamental correction of a surplus situation requires one or more of four conditions: (1) an increase in demand, (2) a reduction in volume, (3) a decrease in the costs of marketing, and (4) a decrease in the costs of production.

The demand for California summer oranges may be increased by (a) advertising and trade promotion, (b) development of new outlets, (c) improvement in quality, and (d) maintenance of trade confidence. Each of these factors is important but it does not appear that their combined effect will relieve the situation as long as the buying power of consumers remains low.

A reduction in volume of oranges marketed may be brought about by (1) the

removal of acreage, (2) decrease in yields per acre, and (3) limitation of shipments. It will be a long time, however, before production of summer oranges in this state is materially reduced by the removal of acreage or by a decrease in yields per acre due to neglect. Tree fruit acreages cannot be quickly adjusted downward. Operators of orange orchards are much more susceptible to the effects of low returns than are the trees. While it may be that many owners will be forced out of the business, most of their orchards will be taken over by others and will continue in production.

A decrease in the cost of marketing either results in an increase in the price to growers for the same volume of the product or enables growers to sell a larger volume at the same price. If the entire reduction in marketing costs accrues to growers, they obtain a higher price at the farm with no increase in the price to consumers, and therefore no decrease in consumption. On the other hand, if the entire reduction in marketing costs accrues to consumers, prices to consumers are reduced and consumption increased with no decrease in the farm price. A reduction in marketing costs while possible cannot usually be quickly brought about. During the five years of 1926-27 to 1930-31 about 85 per cent of the total cost of marketing oranges was for transportation charges and jobbers' and retailers' margins, while only 12 per cent was for packing and only 3 per cent for selling and advertising. These items of cost are charges for essential services. They cannot be entirely eliminated and they are likely to be reduced only slowly.

There is the possibility of further decreasing the cost of producing oranges, but even here a point is soon reached below which no further reduction is possible without injury to the quality of the crop.

An increase in demand, a reduction in acreage, a decrease in the costs of marketing, and a decrease in the costs of production are fundamental in correcting a surplus situation, but it usually requires a long time for them to exert a material influence. The only means of immediately alleviating the difficulties of surplus production is the regulation of shipments as to quantity, quality, time, and place.

Effect of the Quantity of California Shipments of Summer Oranges in Packed Boxes to Domestic Markets Upon Average Returns per Acre

One of the important factors affecting the f.o.b. prices received for California summer oranges sold in domestic markets is the total United States supply of summer oranges. Other factors remaining the same, the larger the volume of shipments the lower the price, whereas the smaller the volume of shipments the higher the price. When the supply of oranges is small it can all be sold to people who have large incomes or who desire oranges keenly, but when the supply is large there are more oranges than these people are willing to consume and the remainder must be sold to people with lower incomes or who desire oranges less keenly. And in order to induce this latter class to buy it is necessary to lower the price. A reduction in the volume marketed, therefore, always results in an increase in price, other things being equal. It does not necessarily follow, however, that limitation of shipments would result in an increase in returns per acre. That depends upon three factors: (1) elasticity of demand, (2) proportion of growers that participate, and (3) price at which the crop is being sold.

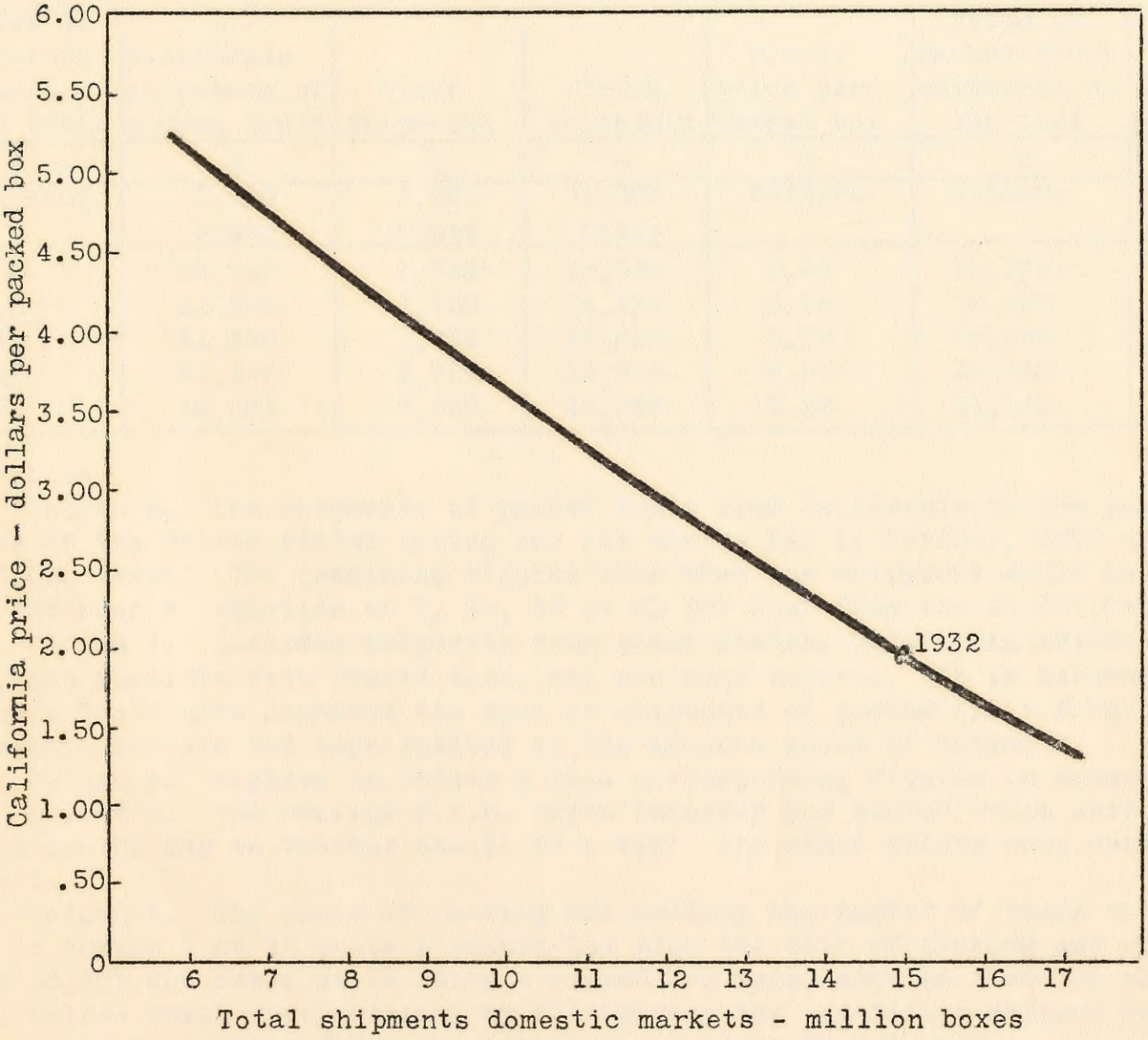
1. Elasticity of Demand. "The elasticity of demand in a market is great or small according as the amount taken increases much or little for a given fall in price, and diminishes much or little for a given rise in price." 3/

3/ Marshall, Alfred Principles of Economics. 8th ed., p. 102. 1920.

The average relation which has existed in the past between the United States domestic shipments of summer oranges and the average f.o.b. prices received for California oranges shipped in packed boxes, adjusted to the situation in 1932, is shown by the curve in figure 1. The slope of this price-quantity curve gives an approximation to the elasticity of demand for summer oranges in the United States and may be used to determine the approximate effect that a change in the total domestic shipments of summer oranges in 1932 would have had upon the average f.o.b. price of California summer oranges. Total shipments of oranges to domestic markets in the United States during the six months of May to October, 1932 amounted to 14,926,000 boxes; California's shipments in packed boxes to domestic markets

Figure 1

Relation Between United States Commercial Summer Orange Supply and F.O.B. Prices Received for California Packed Fruit Sold in Domestic Markets, Adjusted to the Situation in 1932



In 1932 the total shipments of oranges to domestic markets of the United States during the six months May to October amounted to 14,926,000 boxes; the average f.o.b. price of California oranges was $1.93 a packed box. The curve shows the probable extent to which prices would have been increased or decreased in 1932 by changes in the total volume of shipments.

amounted to 13,167,000 boxes, or 88 per cent of the total. The average f.o.b. price obtained by California shippers was $1.93 a packed box. The curve in figure 1 shows that if total shipments in 1932 had amounted to only 12,293,000 boxes, with no change in average grade or sizes, the f.o.b. price would have been around $2.82 a box. If the entire reduction in shipments had been in the shipments of packed fruit from this state, California shipments would have been reduced from 13,167,000 boxes to 10,534,000 boxes, a decrease of 20 per cent. Average returns per acre to California producers of summer oranges from packed fruit shipments to domestic markets in 1932 amounted to $190. If California shipments of packed fruit had been reduced 20 per cent, average returns per acre would have risen to about $264. The detailed calculation of these and other estimates is shown in table 1.

Table 1.
California Summer Oranges 1932: Estimated Effect of Limiting Shipments of Packed Fruit in the Domestic Markets of the United States upon F.O.B. Prices and Returns per Acre with 100 Per Cent of the Growers Participating

Domestic Markets, United States						
Decrease in California shipments of packed fruit	California shipments of packed fruit	Other shipments	Total shipments	F.o.b. price per packed box	Value of packed fruit shipments on the tree	Average returns per acre on the tree
1	2	3	4	5	6	7
per cent	1,000 boxes	1,000 boxes	1,000 boxes	dollars	dollars	dollars
0	13,167	1,759	14,926	1.93	15,274	190
5	12,509	1,759	14,268	2.14	17,039	212
10	11,850	1,759	13,609	2.35	18,526	230
15	11,192	1,759	12,951	2.57	19,849	247
20	10,534	1,759	12,293	2.82	21,200	264

Explanation:

Column 2. The shipments of packed fruit from California to the domestic markets of the United States during the six months May to October, 1932 amounted to 13,167,000 boxes. The remaining figures show what the shipments would have been if there had been a reduction of 5, 10, 15 or 20 per cent from the 13,167,000 boxes.

Column 3. Includes shipments from other states, California shipments of loose fruit, and receipts from Puerto Rico, but excludes exports. It is assumed that these shipments would have remained the same if shipments of packed fruit from California to domestic markets had been limited to the amounts shown in column 2.

Column 4. Figures in column 2 plus corresponding figures in column 3.

Column 5. The average f.o.b. price received for packed fruit shipped during the six months May to October was $1.93 a box. The other prices were derived from figure 1.

Column 6. The costs of packing and selling the number of boxes shipped as given in column 2 at 62 cents a packed box plus the cost of picking and hauling the entire 13,167,000 boxes at 15 cents a packed box were deducted from the estimated f.o.b. values which were obtained by multiplying the quantities shipped as given in column 2 by the corresponding f.o.b. prices as given in column 5.

Column 7. These estimated returns per acre include only the money received from the sale of packed fruit in the domestic markets and do not include the money received from the sale of loose fruit or the exports of packed fruit. In 1932 about 82 per cent of the total shipments of California summer oranges were sold as packed fruit in domestic markets. The average yield on a good orchard of mature trees is around 200 packed boxes per acre. It is assumed that 164 of the 200 boxes were sold as packed fruit in the domestic markets. The average return on the tree from the sale of 164 packed boxes in 1932 was $190.

2. Proportion of Growers that Participate. In the foregoing discussion it was assumed that if shipments in 1932 had been limited, 100 per cent of the growers would have participated. If a smaller percentage of the growers had participated, the returns per acre to the growers participating in a given reduction in shipments would have been smaller. Table 2 shows the estimated returns per acre with varying percentages of the growers participating. It is significant that the larger the proportion of growers who participate in limiting shipments, the greater is the increase in their returns per acre. While growers controlling 70 per cent of the California shipments of packed fruit could increase their own returns per acre to some extent by limiting shipments, they would place themselves in a disadvantageous position relative to those who do not participate. Consequently, it is likely that if growers having only 70 per cent of the California summer orange crop undertook to limit shipments, they would soon find their numbers so reduced that any limitation on the part of the remainder would not result in an increase in their own returns. At least 90 per cent of California industry and if possible even a higher percentage is necessary to assure reasonable permanence in a program of surplus control.

Table 2

California Summer Oranges 1932: Estimated Effect of Limiting Shipments Upon Average Returns per Acre on the Tree with Varying Percentages of the Growers Participating

Percentage of growers participating	Reduction in shipments (thousands of boxes)				
	None	658	1,317	1,975	2,633
1	2	3	4	5	6
per cent	$ per acre	$ per acre	$ per acre	$ per acre	$ per acre
100	190	212	230	247	264
90	190	211	227	242	256
80	190	209	223	235	246
70	190	207	218	226	233

Explanation:

The figures in this table are the estimated returns per acre to those growers who participate in limiting shipments.

If all of the producers of summer oranges in California in 1932 had participated in limiting shipments and if 2,633,000 boxes of the 13,167,000 boxes of packed fruit sold in domestic markets had been withheld from the market, the reduction in packed-fruit shipments to domestic markets of the average grower would have amounted to 20 per cent. Instead of selling 164 packed boxes per acre in the domestic markets (see explanation, table 1), the average grower would have sold only 131 packed boxes but he would have received around $2.82 a box instead of $1.93 a box (see table 1, column 5) and consequently his total returns on the tree would have been about $74 an acre higher. However, if growers controlling only 70 per cent of the summer oranges produced in California in 1932 had withheld 2,633,000 boxes of packed fruit from the domestic markets in order to effect a reduction of 20 per cent in the total shipments, the reduction in shipments of the average grower participating would have amounted to 28.6 per cent. Instead of selling 164 packed boxes per acre, he would have sold only 117 packed boxes. According to the estimates in table 1, column 5, he would have received $2.82 a packed box instead of $1.93 a packed box. His returns per acre on the tree would have been around $43 an acre higher, but around $31 an acre less than if all of the growers had participated.

3. Price at Which the Crop is Being Sold. Reduction in the volume marketed is not only more desirable when demand for oranges is low, but it is also more effective in increasing returns per acre. Table 3 shows the estimated increase in returns per acre from a reduction in the volume marketed if demand conditions had been such that the average f.o.b. price in 1932 was 50 cents a box higher or 50 cents a box lower than existed. It will be noted that the lower the price at which the crop is being sold the greater is the increase in returns per acre, both absolutely and relatively, from a given reduction in shipments; while the higher the price at which the crop is being sold the smaller the increase in returns per acre. This table, therefore, illustrates two important facts: First, that when the entire crop can be sold at reasonably good prices, limitation of shipments even if undertaken by all of the growers does not result in a large percentage increase in returns per acre. Second, that limitation of shipments is imperative in years when the entire crop cannot be sold except at very low prices, in order to avoid distressingly low returns to growers.

Effect of Change in the Quality of Oranges Shipped from California Upon the Average F.O.B. Prices

Tables 1, 2, and 3 show the influence of limitation of shipments applied proportionally to each size and grade. It is not likely, however, that this would occur. Instead, limitation of shipments would tend to be applied first to those sizes and grades selling at the lowest prices; and to the extent that this was done, f.o.b. prices and average returns per acre would be increased more than if limitation were applied proportionately to each grade and size.

Table 3

Estimated Effect of a Reduction in Shipments of California Summer Oranges in Domestic Markets in 1932 Upon Returns per Acre with F.O.B. Prices at Various Levels

(With 100 per cent of growers participating)

Percentage reduction in shipments from 13,167,000 boxes	Estimated returns per acre with f.o.b. prices at		
	$1.93	$1.43	$2.43
1	2	3	4
per cent	dollars	dollars	dollars
0	190	108	272
5	212	134	290
10	230	157	304
15	247	177	316
20	264	198	329

Explanation:

In the first row, the second column gives the average returns per acre in 1932, the third column gives what it would have been if the average f.o.b. price received for the entire shipments of 13,167,000 boxes had been 50 cents a box lower, and column 4 gives what it would have been if the average f.o.b. price had been 50 cents a box higher than it was. The remaining rows give the estimated returns per acre if shipments had been reduced by the amounts given in the first column.

There are, of course, considerable differences in the prices received for various grades and sizes of oranges. The price differentials do not remain constant, however, but instead vary from time to time depending mainly upon the relative volume of the grades and sizes offered upon the market. While first grade oranges always bring a higher price than second grade oranges of the same sizes, the difference is sometimes large and sometimes small. When the total shipments run very heavy to first grade oranges, the premium is small; but when the total shipments run lighter to first grade oranges, the premium is large. The same relationship applies to sizes. When the crop runs heavy to small sizes they sell at a considerable discount; but when the supply of small sizes is light relative to the total crop, the small oranges may even sell at a premium.

Table 4 shows the average f.o.b. prices received for summer oranges in 1932 by sizes and grades. If shipments in that year had been limited, it would have paid to eliminate most of the "other" grades of fruit smaller than 216s before 360s and smaller of the first grade, but it would have paid to eliminate the smallest sizes of the first grade before 216s of the "other" grades. Undesirable sizes of first grade fruit frequently sell for lower prices than the desirable sizes of "other" grades. By eliminating those sizes and grades selling at the lowest prices, the effect of a given reduction in shipments upon returns per acre is increased. An analysis of the relationships that have existed between the average f.o.b. prices and the average sizes of the oranges shipped and the proportions of the total shipments that were first grade indicates that if in 1932 all of the "other" grade oranges smaller than 216s and all of the first grade oranges smaller than 288s had been eliminated, the average returns per acre would have been about $12 higher than if the same reduction in volume had been applied proportionally to all grades and sizes.

There is seldom a sufficient quantity of undesirable sizes of fruit below first grade to result in much of an increase in the returns per acre if all of it is withheld from the market. In 1932 when the proportion of first grade fruit was smaller than in either 1929 or 1931, the entire elimination of the grades of fruit other than first grade of sizes smaller than 216s would have resulted in a decrease of less than 12 per cent in total shipments from California (table 4). As has already been pointed out, any further limitation would have resulted in a larger increase in returns if applied to the least desirable sizes of first grade fruit than to 216s of the "other" grades. In both 1929 and 1931 only 2 per cent of the total

Table 4

F.O.B. Prices of California Summer Oranges 1932, by Sizes and Grades

Size	F.O.B. price per packed box		Percentage of total shipments	
	First grade	Other grades	First grade	Other grades
1	2	3	4	5
number	dollars	dollars	per cent	per cent
176	2.41	1.75	7.9	2.9
200	2.26	1.69	10.9	3.9
216	2.17	1.65	17.7	6.3
252	2.06	1.56	13.7	5.3
288	1.92	1.45	12.0	4.8
324-344	1.68	1.34	5.2	1.4
360 & smaller	1.58	1.23	3.3	.1

shipments sold at prices below the average received for first grade fruit of sizes 360s and smaller. In any year when the surplus of summer oranges is large and the crop is of average quality, a portion of the fruit ordinarily shipped as first grade must be withheld from the market if returns per acre are to be increased substantially.

Ordinarily most of the gain in prices from withholding lower grades and least desirable sizes would be due to reduction in volume rather than to the improvement in the quality of the oranges shipped. An analysis of the data for 1932 shows that about 88 per cent of the estimated increase in the average f.o.b. price from a decrease of 20 per cent in shipments by withholding the lower grades and undesirable sizes may be attributed to the reduction in volume alone, while only 12 per cent may be attributed to the improvement in average sizes and grades.

Relation Between Regulation of Shipments and Maintenance of Trade Confidence

The existence of an uncontrolled surplus of summer oranges in California generally results in excessive supplies in wholesale markets and provides a strong incentive for price cutting among competing shippers. In turn, excessive supplies and price cutting lead to a weak market. As long as his own supplies are moderate relative to demand conditions, no shipper need cut prices in order to move his fruit. But when total supplies are larger than can be sold at the prevailing prices, some shippers in order to dispose of their own fruit resort to price cutting. Other shippers in order to avoid losing their regular customers meet the reduced prices. Once started, price declines tend to become cumulative; each drop in prices discourages sales for the time being and necessitates further price concessions in order to move the fruit. While a reduction in prices of oranges to consumers generally results in an immediate increase in consumption, a reduction in prices to the trade may, if a further decline is in prospect, result in a decrease rather than an increase in sales. When prices are stable, buyers have reasonable assurance that their competitors will not be able to secure oranges more cheaply than they. Consequently, they are active buyers and aggressive sellers. Furthermore, they are willing to operate on narrower margins relative to the services performed since the risk of doing business is not as great. But if the market is weak or price cutting prevalent, buyers have no assurance that their competitors will not be able to buy more cheaply than they and therefore be able to undersell them. Consequently, buyers tend to postpone purchases except for immediate orders.

Distribution of the total quantity to be marketed among the various markets to maintain equal pressure in all markets is always desirable because such distribution results in the highest total returns. In years of surpluses, distribution in accordance with this principle is relatively more important to growers than in years of short crops because a given absolute increase in returns is larger on a percentage basis in years of low prices than in years of high prices.

Price declines in wholesale markets occasioned by competition between shippers are seldom passed on to consumers immediately and therefore seldom result in a prompt increase in consumption. In fact, consumption may even be retarded as long as the market is weak due to the failure of the trade to promote and display oranges adequately. With the prospect of returns from handling oranges uncertain, jobbers and retailers turn their attention to other products. Instead of being active merchandisers of oranges they become merely passive order takers.

Sufficient data are not yet available to enable one to measure precisely the effects of price cutting in wholesale markets upon the returns to growers. During the ten years 1921-1930 there was probably less price cutting in connection with oranges than in connection with many of the fruits grown in this state. Total

supplies of oranges were seldom excessive and the distribution of the available supplies was usually well timed from week to week and well distributed among the markets. Consequently, there was little incentive on the part of any shipper to reduce prices much below the prevailing level. With the large supplies relative to demand conditions in the past two seasons, however, a tendency toward price cutting has developed.

Effect of Limitation of Shipments Upon Consumer Demand and Upon Plantings

In connection with the problem of surplus control there is another important economic question; namely, would limitation of shipments cause retail prices of oranges to rise so high that consumers would tend to substitute other products for oranges, and would it increase returns to growers sufficiently to cause the plantings of oranges to be so greatly expanded that excessively large crops would be produced when this acreage came into bearing? A definite answer to this question requires the collection and analysis of additional data and must therefore be postponed. However, the general principles involved are clear.

If shipments of oranges are too greatly limited, oranges will be expensive as compared with products which serve as substitutes for them. If the relatively high prices of oranges are maintained for an extended period, consumers with smaller incomes and less keen desires for oranges would gradually abandon them in favor of other products. Their accustomed preferences and habits of consumption might be changed sufficiently so that it would be extremely difficult to regain fully their trade once it has been lost. In order for this condition to develop, however, the two essential premises upon which the conclusion is based must be fulfilled. First, that limitation of shipments would result in a material increase in retail prices of oranges relative to retail prices of competing products, and second, that the relatively high retail prices of oranges would be maintained for an extended period. A moderate reduction in shipments of oranges in a year of excessive supplies would not necessarily cause the retail prices of oranges to rise above the relation that existed in previous years. If retail prices of oranges were low relative to retail prices of other products as compared with previous years, a moderate reduction in shipments might only be sufficient to cause retail prices to resume their former relationship. Furthermore, as has already been pointed out, the stabilization of the market from regulation of the quantity shipped would tend to reduce trade margins relative to the services performed so that all of the increase in prices to growers would not be passed on to consumers. The effect of changes in retail prices of oranges upon the consumption of them is not so much from the absolute changes as it is from the changes relative to prices of substitute products.

The effect of increased returns per acre upon the plantings of oranges depends upon two factors: (1) the relation of the anticipated gross returns from orange production to the prospective cost of producing oranges, and (2) the relation of anticipated net returns from orange production to the anticipated net returns from the production of alternative crops. However much the returns per acre may be increased from limitation of shipments, few oranges will be planted if the anticipated gross returns are insufficient to cover the prospective cost of bringing the trees into bearing and maintaining them in production. In order to induce large plantings there must be the prospect of a net return from oranges at least as large as that which could be expected by devoting the land to other crops. There is little likelihood that shipments of oranges would be sufficiently limited to raise returns to a point that would stimulate large additional plantings. As has already been mentioned, a given reduction in shipments is more effective in increasing returns per acre when f.o.b. prices are low than when they are high. When returns per acre are very low,

a considerable increase is not likely to stimulate much additional plantings. In the second place, the pressure on the part of individual growers to ship their oranges whenever prices in eastern markets rise moderately would tend to prevent drastic reduction in total shipments. Even though the increased returns from limitation of shipments should result in additional plantings, it does not necessarily follow that the lower prices which would probably accompany the heavier production five to ten years hence would more than offset the immediate increase in returns from limitation of shipments. That depends upon how much acreage is expanded. With some people, of course, it cannot even be a question of balance between the immediate gains and the prospect of future losses, since they will not be in the business when the future losses occur unless they receive the immediate gains.